K-SYSTEMS

Instruction Manual

Warming plate T47

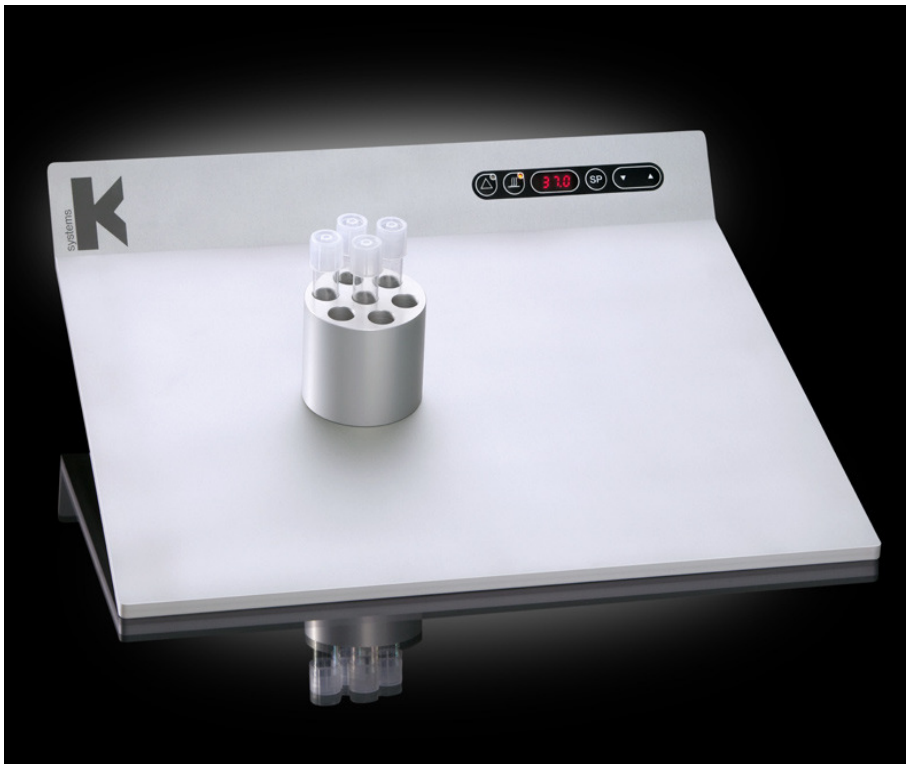

Table of contents

1 GENERAL INFORMATION & SERVICE 3

2 UNPACKING AND INSPECTION 4

3 ACCESSORIES 4

3.1 STANDARD ACCESSORIES 4
3.2 OPTIONAL EQUIPMENT 5

4 USER MANUAL 6

4.1 DEFINITION OF USE 6
4.2 GENERAL DESCRIPTION 6

5 FEATURES AND OPERATION 7

5.1 ASSEMBLING THE T47 7
5.2 CONNECTION TO THE MAINS 7
5.3 START OF APPARATUS 7
5.4 KEYBOARD FUNCTIONS 7
5.5 OPERATING THE HEATED AREA 8
5.6 TEMPERATURE SETTING AND CONTROL 8
5.7 COMBINATION KEYS 8
5.8 TEMPERATURE ALARM 9
5.9 WARMING UP 9
5.9.1 Safety barrier 9

6 MENU FUNCTION 10

6.1 OVERVIEW OF OPTIONS 11
6.2 UNIT 12
6.3 RS232 13
6.4 TUNE 14
6.5 INT.T 15
6.6 TI.ST 15
6.7 ST.ST 16
6.8 HEAT 17
6.9 A-ST 18
6.10 HOUR 19
6.11 REST 20

7 USER MAINTENANCE 21

7.1 CLEANING 21
7.2 CALIBRATION 21

8 TROUBLE SHOOTING 22

9 TECHNICAL DATA 22

10 LIMITED WARRANTY 23

11 LIABILITY 24

12 REPLACEMENT 24

1 General Information & Service

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Users of K-SYSTEMS Kivex Biotec products should not hesitate to contact us if there are any unclear points or ambiguities in this manual.

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Issue 2
Changenote No: 424

Service address:
Please contact your local K-SYSTEMS Kivex Biotec distributor for details of your nearest authorised service agent.

CAUTION If the equipment is used in a manner not specified by this manual, the safety of the user may be at risk and the equipment may be damaged. Always use the equipment as outlined in this instruction manual.

2 Unpacking and inspection

- **Unpack the equipment.**
- **Check the packing list to insure all accessories are there.**
- **Examine the packing material carefully for separately packed items.**
- **Check the warming plate for external surface damage.**
- **Check that the display is not broken or damaged.**

3 Accessories

3.1 Standard accessories

24 volts main adapter (PSU) Order code: 51122	
Mains Cable Standard Schuko – Oder code: 52768 UK – Order code: 53886 US – Order code: 52773	

3.2 Optional equipment

Optional equipment consists of a range of warming blocks. Please contact your local distributor or K-SYSTEMS Kivex Biotec for details about the full range of warming blocks.

Examples of different types of warming blocks

Warming block B01 Holds seven tubes Ø17 mm Falcon 352001 Order code: 26001	
Warming block B06 Holds twelve tubes of Ø12 mm Falcon 352003 NUNC 343923 Order code: 26006	
Warming block B09 Holds two tubes of Ø17 mm Falcon 352095 Order code: 26018	
Warming block B28 Holds one 4-well dish Falcon 176740 Order code: 26029	

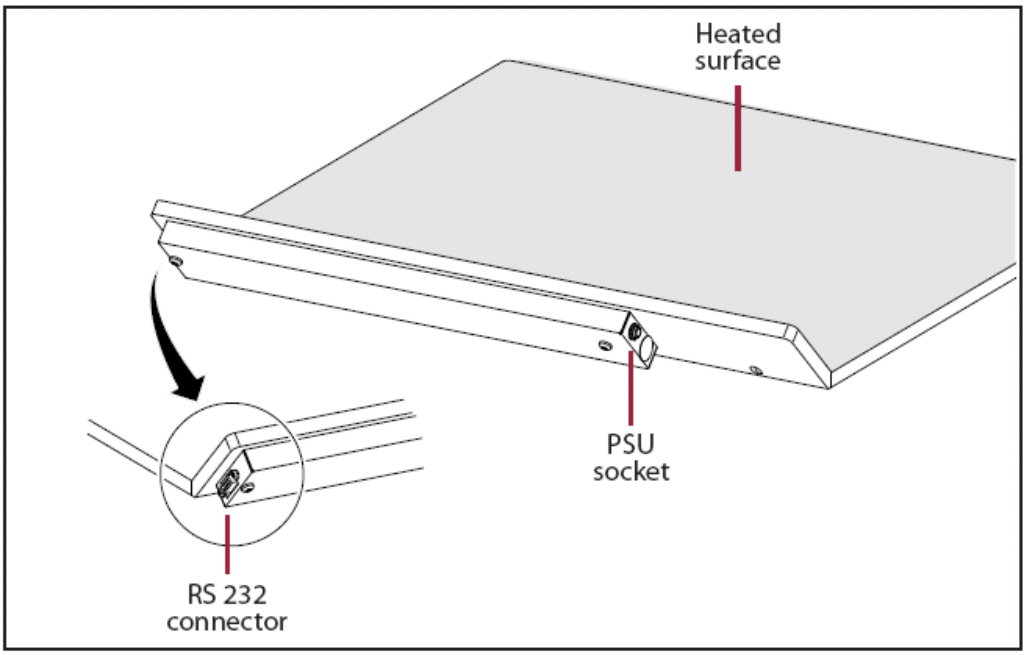
4 User Manual

4.1 Definition of use

The K-SYSTEMS Kivex Biotec T47 warming plate is designed for warming the media used during oocyte retrieval in both human and animal assisted reproduction. It can also be used for maintaining a stable temperature of cells and specimens in a test tube/syringe or similar.

4.2 General description

The aluminium surface maintains a preset temperature in the range ambient to 42.0° C. The temperature is electronically controlled by a PID controller and can be read on the display in increments of 0.1° C.



5 Features and operation

5.1 Assembling the T47

No assembly needed. Just follow directions in section 5.2 and the unit is ready for use.

5.2 Connection to the mains

The mains voltage is automatically regulated to the correct level by the main adapter (PSU).
Connect the T47 to the mains supply using the enclosed PSU.
For safety reasons the unit has an external PSU which operates at a low voltage.

5.3 Start of apparatus

Connect the unit to the PSU and the PSU to the mains wall socket.
To power up the unit, press the heat on button on the keyboard. The display will indicate the current temperature.

5.4 Keyboard functions

Alarm	
Heat ON/Off	
LED Display	
Setpoint	
Arrow keys UP/DOWN	

5.5 Operating the heated area

Action	Key	
Press heat ON/OFF key to show the actual temperature.		

5.6 Temperature setting and control

The display indicates the average temperature of the surface.

Action	Key
Press setpoint key until set temperature is shown.	
Press and hold setpoint key.	
While holding the setpoint key in, press either the arrow UP or arrow DOWN key to raise or lower the set temperature. When the desired temperature is reached, let go of the setpoint key.	

Note The setpoint can be adjusted to a reading between ambient and 42.0 ˚C.

5.7 Combination keys

Action	Key	Display
Press alarm and UP key.		The keyboard is locked.
Press alarm and arrow UP key.		The keyboard is unlocked.
Press Heat ON/OFF and setpoint key.		Switches between temperature and time.

5.8 Temperature alarm

The temperature alarm indicates too high or too low temperature.
The alarm will be activated if the temperature rises or falls more than 0.5° C from the setpoint.
There will be an acoustic signal and the red LED light in the alarm key will be activated.

Action	Key
Press alarm key to mute the acoustic signal.	
Press alarm key once again to bring the signal back on.	

Note *The red LED light and the acoustic signal will turn off when the temperature stabilizes to the setpoint level.*

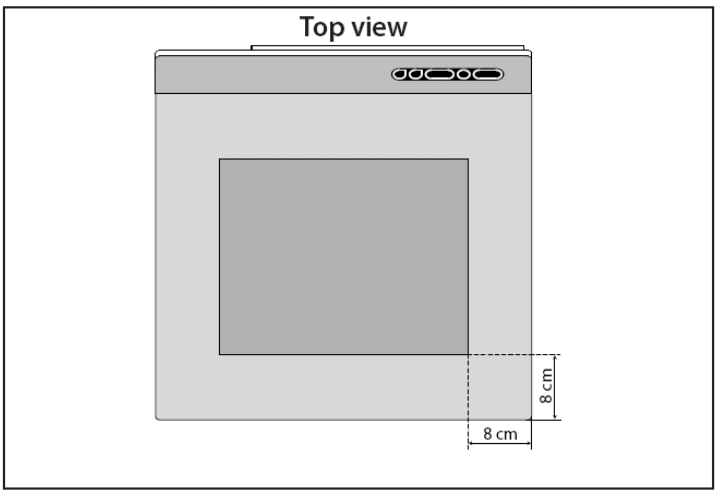
5.9 Warming up

Warming up from 20.0 to setpoint takes less than 30 minutes, under normal conditions. When a cold item is placed on the heated area it may need up to 40 minutes to stabilize, depending on the thermal mass of the object and the initial temperature.

5.9.1 Safety barrier

There is a greater heat loss from the edges of the warming plate, and the tolerances can not be kept as precisely in these areas. A high accuracy can only be maintained in the centre area of the warming plate.

Please see picture below:



Our general recommendations:

- Dark area only: ±0.3° Celsius
- Whole area:: ±0.8° Celsius

Note *If the nature of your work demands high accuracy of temperature, then only the area* marked above must be used. This area is located 8 cm from the edges.

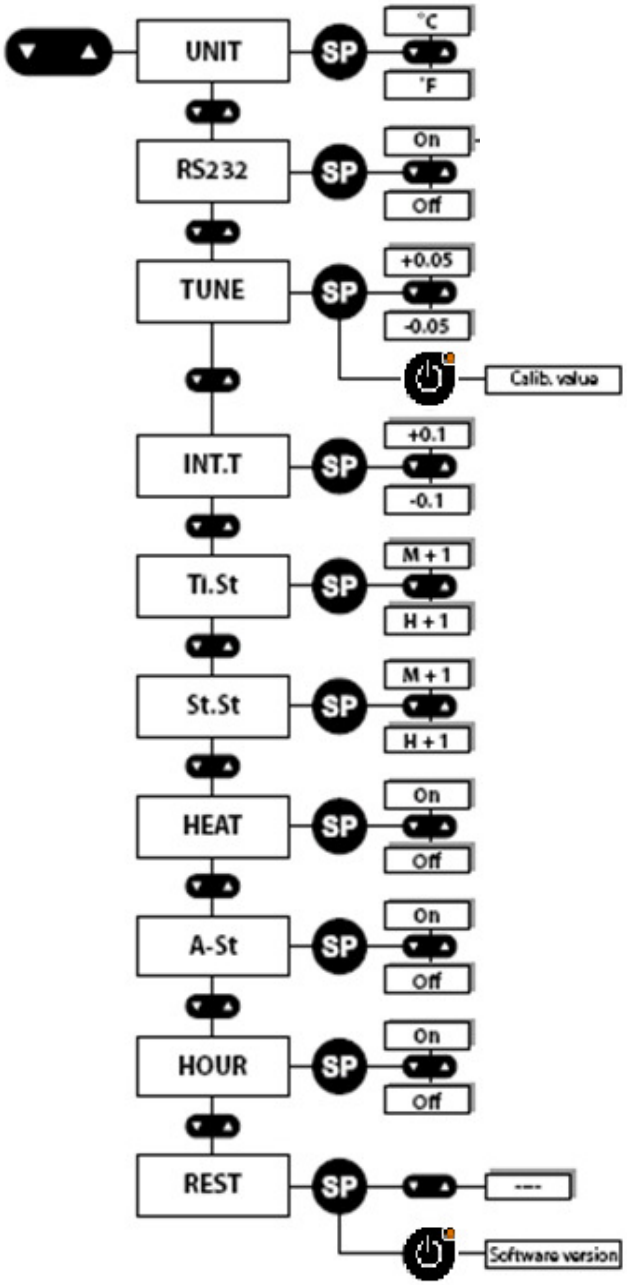
6 Menu function

The user can access a number of advanced functions via the menu.

Action	Key	Display
Press and hold UP+DOWN key for 3 seconds to enter the menu. The first option “UNIT” will appear in the display.		
Press UP/DOWN key to navigate within the Menu.		
While holding the setpoint key in, press either the arrow UP or arrow DOWN key to change values within the options.		
Press and hold UP+DOWN key for 3 seconds again to exit the menu.		

The menu consists of the 10 options listed below.
For further detail see the description on the following pages.

6.1 Overview of options



6.2 UNIT

In the UNIT option the **displayed temperature** unit can be set to either degrees **Celsius** or **Fahrenheit.**

Follow these steps to navigate in the UNIT option.

Action	Key	Display
Press and hold UP+DOWN key for 3 seconds to enter the menu. The menu "UNIT" will appear in the display.		
Press and hold setpoint key to change values.		
While holding the setpoint key in, press either the arrow UP or arrow DOWN key to select the required type of unit. When the required type has been selected let go of the setpoint key.		
Press and hold UP+DOWN key for 3 seconds to exit the menu.		

6.3 RS232

The RS232 option is for serial communication and data logging of the **temperature and alarm conditions.**

Follow these steps to navigate in the RS232 option.

Action	Key	Display
Press and hold UP+DOWN key for 3 seconds to enter the menu. The option "UNIT" will appear in the display.		
Press DOWN key until the option “RS232” appears in the display.		
Press and hold setpoint key to change values.		
While holding the setpoint key in, press either the arrow UP or arrow DOWN key to select between "ON" and "OFF". “OFF”: The RS232 function is turned off. “ON”: Data is send once every two seconds. When the required setting is activated, let go of the setpoint key.		
Press and hold UP+DOWN key for 3 seconds to exit the menu.		

Note *The RS232 cable must be connected before start.*

6.4 TUNE

The TUNE option is for **calibration** of the **displayed temperature.**
If there is an offset between the value on the display and any measurements made with a high precision external temperature sensor, this can be corrected.
The new temperature reading will be kept as the displayed value, with temperature control conducted on this basis.

Follow these steps to navigate in the TUNE option.

Action	Key	Display
Press and hold UP+DOWN key for 3 seconds to enter the menu. The menu "USER" will appear in the display.		
Press DOWN key until the option “TUNE” appears in the display.		
Press and hold setpoint key to change values.		
While holding the setpoint key in, press either the arrow UP or arrow DOWN key to select the value temperature. When the required setting is activated, let go of the setpoint key.		
Press and hold UP+DOWN key for 3 seconds to exit the menu.		

☛ *Any change in the factory set calibration should always be based on very certain temperature measurements. K-SYSTEMS Kivex Biotec only recommend the use of a high quality PT-100 sensor that is calibrated with the precision instrument used for measuring according to the manufacturers specifications. Also ensure an optimal contact between the sensor and the place measured. Use only a sensor type that is correct for the purpose and of correct size. If in doubt contact your local distributor or K-SYSTEMS Kivex Biotec.*

6.5 INT.T

The INT.T (Integral Time) option is for changing the **base value** for the **PID controller.** This should not be attempted by unauthorized persons. If set at a different level the controlling principle will be affected.
From the factory it is set to a closely calculated value specific for the model.

CAUTION *Do not change the value here. If by mistake any changes are made or doubts occur if the value are correct please set the REST function in the menu for the restore of the defaults.*

6.6 TI.St

The Ti.St (Time Set) option is for **setting the time.**

Follow these steps to navigate in the Ti.St option.

Action	Key	Display
Press and hold UP+DOWN key for 3 seconds to enter the menu. The option “UNIT” will appear in the display.		
Press DOWN key until the option "Ti.St." appears in the display.		
Press and hold setpoint key to change values.		
While holding the setpoint key in, press either the arrow UP to change minutes or arrow DOWN key to change the hour.		
Press and hold UP+DOWN key for 3 seconds to exit the menu.		

6.7 St.St

The St.St (Start Set) option is the **timer function** for the **heat.**
By using this option, time can be saved as the T47 can be ready for use before procedures start in the morning.

Note *This function will only work correctly if the clock is set.*

Follow these steps to navigate in the St.St option.

Action	Key	Display
Press and hold UP+DOWN key for 3 seconds to enter the menu. The menu "UNIT" will appear in the display.		
Press key DOWN until the option "St.St" appears in the display.		
Press and hold setpoint key to change values.		
While holding the setpoint key, press either the arrow UP to change minutes or arrow DOWN key to change the hour. When the time is set, let go of the setpoint		
Press and hold UP+DOWN key for 3 seconds to exit the menu.		

Note *If the function Heat is set, a dot will light up in the right side of display.*

St.St is connected with HEAT. It must be chosen when the timer starts.
To turn the heater on, please see section 6.8 HEAT.

WARNING *Always make sure when the timer function is being used, that the heated area is clear of any objects that might be damaged by the heat or adversely affected by it in way.*
Caution should always be exercised when a heated area is turned on without any supervision.

6.8 HEAT

The HEAT option is used for the heater to **turn on at a certain time**.

Note *This function only works in conjunction with St.St.*
If St.St is set to 8.00 and heat function is on, the heater will automatically turn on at 8.00 using 24 hour clock.

Follow these steps to navigate in the HEAT menu.

Action	Key	Display
Press and hold UP+DOWN key for 3 seconds to enter the menu. The first menu "UNIT" will appear in the display.		
Press DOWN key once and the menu "HEAT" appears in the display.		
Press and hold setpoint key to change values.		
While holding the setpoint key in, press either arrow UP or arrow DOWN key to select between “ON” and “OFF”. When the required setting is activated, let go of the setpoint key.		
Press and hold UP+DOWN key for 3 seconds to exit the menu.		

Note *A dot will turn on in the right side of display, indicating that the Heat function is active.*

6.9 A-ST

The A-St (Automatic Start) option is used to **repeat the timer** (St.St) function **every day of the week.**

Note *This function works in conjunction with St.St and HEAT. If St.St.is set to 8.00 and heat function is on, the heater will automatically turn on at 8.00 every day.*

Follow these steps to navigate in the A-st option.

Action	Key	Display
Press and hold UP+DOWN key for 3 seconds to enter the menu. The option “UNIT” will appear in the display.		
Press DOWN key until the option “A-st” appears in the display.		
Press and hold setpoint key to change values.		
While holding the setpoint key in, press either arrow UP or arrow DOWN key to select between “ON” and “OFF”. When the required setting is activated, let go of the setpoint key.		
Press and hold UP+DOWN key for 3 seconds to exit the menu.		

Note If this function is set to ‘on’ the heat function will be repeated every day, but if A-St function is set to ”off” the heat function will only be activated one time.

6.10 HOUR

The HOUR option gives the opportunity to **show the time** on the display when the **heat is off.**

Follow these steps to navigate in the HOUR option.

Action	Key	Display
Press and hold UP+DOWN key for 3 seconds to enter the menu. The option “UNIT will appear in the display.		
Press DOWN key until the option "HOUR" appears in the display.		
Press and hold setpoint key to change values.		
While holding the setpoint key in, press the arrow UP or arrow DOWN key to select between “ON” and “OFF”. When the required setting is activated, let go of the setpoint key.		
Press and hold UP+DOWN key for 3 seconds to exit the menu.		

If you want to see the time on the display when the heat is turned on.
Follow these steps to switch between time and temperature.

Action	Key	Display
Press and hold setpoint key.		
While holding the setpoint key in, press the HEAT key one time, then let go of the setpoint key. The display now shows the time.		

To change back to temperature.

Action	Key	Display
Press and hold setpoint key.		
Press the HEAT key one time, then let go of the setpoint key. The display now shows the temperature.		

Note *The time is shown as a 24 hour clock e.g 19.30 not 7.30 PM.*

6.11 REST

The REST function will **restore all factory set values.**
Any changes made to the displayed temperature, unit readings and controller value will be reset.

Note *Calibration value in the TUNE option will remain and not be reset.*

Follow these steps to navigate in the REST option.

Action	Key	Display
Press and hold UP+DOWN key for 3 seconds to enter the menu. The option “UNIT” will appear in the display.		
Press DOWN key until the option “REST” appears in the display.		
Press and hold the setpoint key to change values.		
While holding the setpoint key in, press either the arrow UP or arrow DOWN key. When the display shows “-----“, *let go of the setpoint key.		
Press and hold UP+DOWN key for 3 seconds to exit the menu.		

*This means all factory values have now been restored.

7 User maintenance

7.1 Cleaning

The T47 is a low maintenance unit designed to be both easy to use and clean, plus it is durable due to its construction.

All surfaces should be cleaned with a 70% alcohol solution on a clean cloth or lint-free paper towel.

- Clean all surface components by wiping gently with gauze.
- To remove fingerprints or oil smudges, wipe with gauze slightly moistened with a mixture of ether (70%) and alcohol (30%).

Note *Since solvents such as ether and alcohol are highly flammable, they must be handled carefully. Be sure to keep these chemicals away from open flames or potential sources of ignition – electrical equipment must be switched off. Also remember to always use these chemicals only in a well ventilated room.*

- If smudges are difficult to clean, wipe them with a soft cloth slightly moistened with a diluted neutral detergent.
- The heated area is able to withstand some water spills. However, precautions are still necessary if water is spilled on the surface. Unplug the power cord, and then wipe dry with a dry cloth immediately.

Note *If water gets inside the unit, contact your K-SYSTEMS Kivex Biotec representative to check electrical safety.*

7.2 Calibration

For optimal performance the unit should be calibrated once a year by authorized K-SYSTEMS Service provider.

8 Trouble shooting

Symptom	Cause	Action
Temperature alarm is on.	Temperature more than ±0.5° C from set temperature.	Check the set temperature. Wait for the temperature to stabilize.
No heating.	Setpoint below ambient.	Change setpoint (eg. 37° C).
Display remains off when “HEAT” key is activated.	No mains supply.	Plug in the power connector.
	Power connector, not connected.	Reconnect power connector.
	Defective “HEAT” key.	Replace the keyboard.

9 Technical data

Material	Aluminium
Weight (without PSU and BLOCK)	2.66 kg
Overall dimentions (WxDxH)	470x460x60 mm
Warmed surface area (WxD)	470x400 mm
Temperature range	Ambient to 42.0° C
Spot temperature accuracy	±0.2° C
Temperature set/read	Digital LED display
Power consumption	90 W
Heating	88 W
PSU	AC input 100-240V 50-60 Hz 1.6A MAX DC output 24V/5A
Alarms	Audible and visible for out of range temperature

10 Limited warranty

K-SYSTEMS Kivex Biotec warrants to the purchasers of all devices and products manufactured by K-SYSTEMS Kivex Biotec, the product was prepared and tested in accordance with good manufacturing practices and guidelines and are in compliance to the CE norms issued by the competent authority.

This limited warranty does not apply to products subjected to abnormal use or conditions, improper storage, damaged by accident, misuse or abuse, improper line voltage, products whose serial number has been altered, to products not shipped in accordance with the recommendations of K-SYSTEMS Kivex Biotec, and/or to products altered or serviced by anyone other than K-SYSTEMS Kivex Biotec authorised distributors. Distributor is responsible for the labour and travel costs during this period.

This limited warranty is exclusive and in lieu of all other warranties whether written, oral, expressed or implied. In particular, K-SYSTEMS Kivex Biotec does not warrant that the product is suitable for the needs of the purchaser and there are no warranties given as to merchantability or fitness for a particular purpose other than the one specified in K-SYSTEMS Kivex Biotec literature that accompanies every specific product. K-SYSTEMS Kivex Biotec assumes that the Purchaser is experienced in the use of this device and is able to judge from his/her own expertise the suitability or otherwise of the product for the intended use.

K-SYSTEMS Kivex Biotec reserves the right to change or discontinue this product without prior notice.

11 Liability

Because K-SYSTEMS Kivex Biotec has no control or influence over the conditions under which this device is used, over its method of use or administration, or on handling of the product after it leaves its possession, K-SYSTEMS Kivex Biotec takes no responsibility for the results, use and/or performance of the product. K-SYSTEMS Kivex Biotec expects that use of the product will be confined to trained and expert users.

In no event shall K-SYSTEMS Kivex Biotec be liable for any direct or indirect damages including incidental, consequential or special damages, arising out of or in connection with the use or performance of the product.

If K-SYSTEMS Kivex Biotec provides you with technical documentation, this does not authorise you to perform repairs, adjustments or alterations on the device or accessories.

No representative of K-SYSTEMS Kivex Biotec and no vendor of the product is authorised to change any of the foregoing terms and conditions, and the purchaser accepts the product subject to all terms and conditions herein, subject always to any contrary provisions which are necessarily implied by stature or law notwithstanding the within terms and conditions.

12 Replacement

As mentioned in the Limited Warranty, the decision whether to provide any remedy or whether to refund any portion of the purchase price shall be at the discretion of K-SYSTEMS Kivex Biotec.

Before returning a product for any reason, please contact your nearest K-SYSTEMS Kivex Biotec distributor for assistance and instructions.

Only for all customers in Denmark, Norway and Sweden, please take direct contact with our head office at:

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